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1945

THE PAN-PACIFIC ENTOMOLOGIST

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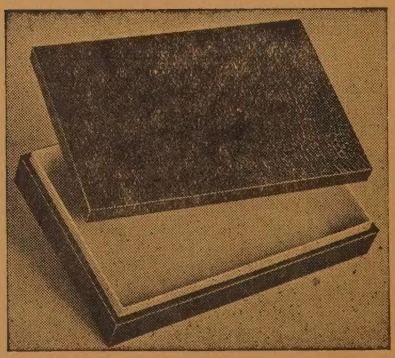

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NOTES ON AMMOPLANUS

(Hymenoptera: Sphecidae: Pemphredonini)

BY V. S. L. PATE
Cornell University

A review of the Nearctic forms of the interesting thripotherous genus *Ammoplanus* was presented recently.[1] At that time representatives of only the typical subgenus and of *Parammoplanus* Pate were known to occur in North America: *Ammoplanellus* Gussakovsky was believed to be confined wholly to the Old World. But in the material of *Ammoplanus* in the United States National Museum, which I have been privileged to study through the courtesy of Dr. E. A. Chapin, are representatives of two Nearctic species of *Ammoplanellus*. Descriptions of these interesting novelties are presented below, together with notes on some related forms.

Subgenus AMMOPLANELLUS Gussakovsky

Ammoplanus (*Ammoplanellus*) Gussakovsky, Bol. Soc. Espań. Hist. Nat. XXXI, p. 442, (1931). Pate, Bull. So. Calif. Acad. Sci., XLI, p. 144, (1943).

Genotype: *Ammoplanus* (*Ammoplanellus*) *chorasmius* Gussakovsky, 1931. (Monobasic and by original designation.)

The subgenus *Ammoplanellus* differs from both *Parammoplanus* and the nominate complex by the female lacking a distinct pygidial area on the ultimate abdominal tergite and by the males having the terminal abdominal sternites simple and unmodified. Additionally, the fore wing of *Ammoplanellus* has the costa absent distad of the stigma and the radial vein does not attain the costal margin, thus leaving the marginal cell broadly open anteriorly. In this respect the present group resembles *Parammoplanus*. But in *Ammoplanellus* the hind tibiae are distinctly bowed or curved in lateral aspect; the pronotal tubercles

[1] Pate: Nearctic Ammoplanus. Bull. South. Calif. Acad. Sci., XLI, pp. 141-163, ill., (1943).

are eburneous; the dorsal face of the propodeum is alveolate to areolate; the occipital carina is very well developed and almost a complete circle in extent; the genapontal region of the head is elongate, generally about twice as long as the depth of the oral fossa; and the clypeus is entire and truncate medio-apically. Conversely, in *Parammoplanus,* as well as in *Ammoplanus* in the restricted sense, the hind tibiae are relatively straight; the pronotal tubercles are black or at least concolorous with the remainder of the pronotum; the dorsal face of the propodeum is granular, striate, or aciculate, and usually bisected by a carinule; the occipital carinule is generally shorter and seldom more than a semi-circle in extent; while the genapontal region is relatively short, usually not more than one and a half times the depth of the oral fossa; and the clypeus is diversely excised medio-apically.

Ethology. The species of *Ammoplanellus* probably nest in pre-existing holes or crannies and provision their burrows with thrips as do the forms of the nominate subgenus.[2] Associated with the specimens studied of the following Arizonan form *xila* is a minute Chrysid wasp.[3] From the data now at hand, this Chrysid may prove to be a parasite of *Ammoplanus xila,* and, if so, this will be the first record of any such association in the genus *Ammoplanus.*

Component Species. The subgenus *Ammoplanellus* at present comprehends one Palæarctic species, the Transcaspian *chorasmius* Gussakovsky; three Æthiopian forms, the Southern Rhodesian species *consobrinus* Arnold and *rhodesianus* Arnold, and the Malagasy *madecassus* Kohl; and the following two new western North American species: *umatilla* and *xila.*

Ammoplanus (Ammoplanellus) umatilla[4] Pate, new species (Fig. 3)

The immaculate clypeus, the more coarsely sculptured pronotum and mesonotum, and the alveolate dorsal face of the propodeum, readily distinguish *umatilla* from the following Arizonan form *xila.*

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[2] *Cf.* Pate: Bull. So. Calif. Acad. Sci., XLI, p. 143 (1943).
V. et.: Maneval: Ann. Soc. Ent. France, CVIII, pp. 78-81 (1939).

[3] This Chrysid represents a new genus and species and is apparently somewhat intermediate between the conventional subfamilies Elampinae and Chrysidinae. I have forborne describing it inasmuch as the unique specimen before me is not in a very good state of preservation.

[4] After the Umatilla Indians of Washington.

Type. ♀; PASCO, FRANKLIN COUNTY, WASHINGTON. Elevation, 381 feet. (C. N. Ainslie.) [United States National Museum.]

Female. 2.5 mm. long. Fulgid black, with pronotal tubercles eburneous. The following castaneous: labrum, palpi, apical margin of clypeus, antennal scapes, pedicel, and basal segments of the flagellum (the apical segments brunnescent), tegulae, axillary sclerites, and legs. Mandibles ochraceous with apices red. Wings clear hyaline throughout, iridescent; veins and stigma light brunneous, the latter pellucid at base.

Head fulgid, glabrous or nearly so; subcircular in anterior aspect, the vertex produced above the dorsal margins of the compound eyes for about one-third their length. Front flat; with microscopically fine, moderately distinct, vertical cancellate sculpture to dorsal margins of compound eyes, the sculpture obsolescent above on vertex and occiput; the inner orbits gently arcuate, slightly convergent below, without medial or orbital impressions; ocellocular line one and three-fourths the postocellar distance. Antennae reaching about to pronotum; scapes straight, subcylindrical, two-thirds the vertical eye-length; pedicel obterete, twice the length of first flagellar article; flagellum finely puberulent, inconspicuously incrassate apically, all segments simple, first two segments subequal in length, ultimate article simple, terete, twice the length of penult segment. Interantennal line equal to antennocular distance. Clypeus nitidous, flat to very gently tumid discally, median length one-fifth the vertical eye-length, broadly truncate medio-apically. Labrum subrectangular, the lateral margins gently convergent distad, with a deep U-shaped excision medio-apically. Temples with obscure vertical aciculation. Mandibles simple, apices acute, with a preapical shoulder on inner margins; lower margins entire, edentate.

Thorax fulgid, subglabrous. Pronotum moderately short; with very fine, transverse cancellate rugulation; anterior dorsal margin rounded and gently declivous to level of neck from which it is separated by a finely foveolate, transverse furrow; the dorsal surface bisected by a faint and shallow longitudinal furrow. Mesonotum gently arched anteriorly, with a very fine transverse cancellate rugulation, notauli vaguely indicated on anterior fourth; scutellum flat, with very fine transverse cancellate sculpture, the anterior margin with a strong transverse, sexfoveolate furrow; postscutellum simple, flat, glabrous, nitidous. Mesopleura glabrous, anteriorly with faint cancellate sculpture to subnitidous posteriorly; episternal suture strongly impressed, foveolate, vertical above but curving sharply below to become subhorizontal; mesopleural pit large and distinct; hind margin finely consute. Metapleura glabrous, nitidous, with a few subparallel horizontal rugulae above and finely rugulose below. Propodeum subfulgid, glabrous; dorsal face finely alveolate, the cells with fine cancellate sculpture within, not bisected by a carinule; posterior face with indistinct cancellate

sculpture to alveolation above, traversed by a few subhorizontal rugulae below, and bisected by a faint and shallow vertical sulcus; lateral carinae absent; lateral faces fulgid, with fine oblique rugulae.

Legs simple; all tarsi unmodified; hind tibiae bowed.

Abdomen fusiform, fulgid, largely glabrous save for apical segments which have a very thin and sparse vestiture of fine, decumbent, puberulent whitish hair. Tergites nitidous, with a fine, barely perceptible, transverse aciculation. Ultimate tergite conical, with fine cancellate sculpture, but without a pygidial area.

This interesting little species is known at present from only the unique female taken in southeastern Washington.

Ammoplanus (Ammoplanellus) xila[5] Pate, new species
(Figs. 1, 2)

The eburneous clypeus, labrum, and antennal scapes; the perfulgid and very finely sculptured pronotum and mesonotum; and the more coarsely sculptured propodeum immediately differentiate *xila* from the preceding Washington species *umatilla*.

Type. ♀; PHOENIX, MARICOPA COUNTY, ARIZONA. Elevation, 1,108 feet. August 19, 1942. (R. A. Flock; flying about chair; associated with *Hesperorhipis mirabilis* Knull [Buprestidae] and a small Chrysid wasp.) [United States National Museum.]

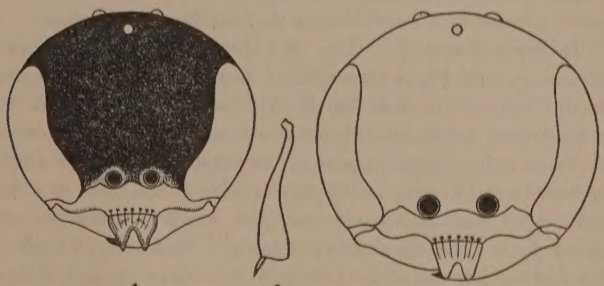
Female. 2.5 mm. long. Perfulgid black; the following eburneous: mandibles save for red apices, palpi, labrum, clypeus, scapes anteriorly, pronotal tubercles, and a spot on tegulae. Fulvous: labrum marginally and basally with two small spots; scapes posteriorly; pedicel; basal articles of flagellum (apical segments brunneous); tegulae; axillary sclerites; and legs, the last with trochanters, bases and apices of tibae, and metatarsi stramineous. Wings clear hyaline, iridescent; veins castaneous; stigma brunneous, pellucid at base.

Head perfulgid, glabrous or nearly so; subcircular in anterior aspect, the vertex produced above the dorsal margins of the compound eyes for about one-third their length. Front flat; with microscopically fine, distinct, vertical cancellate sculpture on lower two-thirds, the sculpture obsolete above on vertex and occiput; inner orbits gently arcuate, slightly convergent below, without medial or orbital impressions; ocellocular line twice the postocellar distance. Antennae reaching about to pronotum; scapes straight, subcylindrical, three-fifths the vertical eye-length; pedicel obterete, twice the length of first flagellar article; flagellum finely puberulent, inconspicuously incrassate apically, all segments simple, first

[5] After the Xila (*seu* Gila) Indians of southern Arizona.

two segments subequal in length, ultimate article simple, terete, twice the length of penult segment. Clypeus nitidous, flat, median length about one-eighth (0.133) the vertical eye-length, broadly truncate medio-apically. Labrum trapeziform, broader than long, the lateral margins weakly sinuous and gently convergent distad, with a deep V-shaped excision medio-apically, the lateral lobes bluntly acute. Temples with very faint and obscure aciculation. Mandibles simple, apices acute, with a preapical shoulder on inner margin; lower margins entire, edentate.

Thorax perfulgid, subglabrous. Pronotum moderately short; with a very fine transverse cancellate sculpture; anterior dorsal



EXPLANATION OF FIGURES

Ammoplanus (*Ammoplanellus*) *xila* n. sp.: Fig. 1.—Anterior aspect of head of female (Type). Fig. 2.—Lateral aspect of hind tibiae (Type).

Ammoplanus (*Ammoplanellus*) *umatilla* n. sp.: Fig. 3.—Anterior aspect of head of female (Type).

margin rounded and gently declivous to level of neck from which it is separated by a finely foveolate, transverse furrow, the dorsal surface bisected by a faint and shallow longitudinal furrow. Mesonotum gently arched anteriorly, with a very fine transverse cancellate sculpture, notauli not evident; scutellum gently tumid, with very fine transverse cancellate sculpture, the anterior margin with a strong transverse, quadrifoveolate furrow; postscutellum simple, flat, glabrous, nitidous. Mesopleura subglabrous, subnitidous throughout; episternal suture strongly impressed, very finely consute, vertical above but curving sharply below to become subhorizontal; mesopleural pit large and distinct; hind margin very finely consute. Metapleura glabrous, subnitidous throughout. Propodeum fulgid, glabrous; dorsal face finely, irregularly areolate, the areoles nitidous within, not bisected by a carinule, but separated from posterior face by a weak, irregular, transverse carinule;

posterior face traversed by a few very fine subhorizontal, subparallel rugulae and bisected by a narrow submarginate vertical sulcus; lateral carinae represented by irregular carinules; lateral faces fulgid, very finely areolate posteriorly and dorsally but finely and faintly rugulate anteriorly below.

Legs simple; all tarsi unmodified; hind tibiae bowed.

Abdomen fusiform, fulgid, largely glabrous save for apical segments which have a very thin and sparse vestiture of fine decumbent puberulent whitish hair. Tergites nitidous, with a barely perceptible, fine, transverse aciculation. Ultimate tergite conical, with fine cancellate sculpture, but without a pygidial area.

Paratype. A topotypical, equidatic female, agreeing with the type in all essential respects save that the head is missing.

Biological Notes. Dr. C. F. W. Muesebeck of the Bureau of Entomology and Plant Quarantine has very kindly supplied me with the information that Mr. R. A. Flock of the Office of State Entomologist, Arizona Commission of Agriculture and Horticulture, observed many specimens of *Ammoplanus xila* and a small (undescribed) Chrysid wasp flying rapidly about holes in a chair from which had previously emerged small powder-post flatheaded borers (*Hesperorhipis mirabilis* Knull). Though the Chrysids are not definitely known to have been reared, it is assumed, perhaps without warrant, that they are social parasites of *Ammoplanus xila.* And if this is so, it will be the first such association of a Chrysid wasp with any member of the Ammoplanoid complex. From what is already known of the biology of *Ammoplanus,* the species do not construct burrows but merely utilize pre-existing cracks, crannies or holes for their nests. In all probability, *xila* in this instance occupied the abandoned borings of the small Buprestid *Hesperorhipis mirabilis.*

Subgenus AMMOPLANUS Giraud

Ammoplanus Giraud, Ann. Soc. Ent. France, (4), IX, p. 469, (1869).
Ammoplanus (*Ammoplanus*) Gussakovsky, Bol. Soc. Españ. Hist. Nat., XXXI, p. 443, (1931); [Palæarctic species]. Pate, Trans. Amer. Ent. Soc., LXII, p. 101, (1937). Pate, Bull. So. Calif. Acad. Sci., XLI, p. 144, (1943); [Nearctic species]. Giner Marí, Eos, XIX, pp. 285, 287, 293, (1943); [Spanish forms].
Ammoplanus (*Ceballosia*) Giner Marí, Eos. XIX, pp. 285, 293, (1943). [Type: *A.* (*Ammoplanus*) *rjabovi* Gussakovsky, 1931.]

Recently in a review of the Spanish forms of *Ammoplanus,*[6]

[6] Giner Marí, Jose.—Monografía de los *Ammoplanus* Gir. de España. Eos, Rev. Españ. Ent. XIX, pp. 281-294, ill. (1943).

Giner Marí has erected the subgenus *Ceballosia* for those forms hitherto referred to *Ammoplanus* (s. str.) in which the males have the hind metatarsi more or less modified—usually expanded into a median tooth or lobe—whilst the females have the clypeus armed medially with a large robust median tooth or apophysis. However, a re-examination of the Nearctic species, as well as a series of several still undescribed Algerian *Ammoplanus* in my cabinet, fails to substantiate Giner Marí's belief that these forms merit recognition as a discrete subgenus. Furthermore, the features upon which Giner Marí has chosen to base his *Ceballosia* are now generally recognized to exhibit extreme variations in individual species. This has been very ably demonstrated by De Beaumont in a recent paper on heterogenic growth in a number of aculeate Hymenoptera.[7] Consequently in view of all this, I believe that *Ceballosia* must be regarded as merely a synonym of *Ammoplanus* in the restricted sense, although the component Palæarctic forms (*rjabovi* Guss., *platytarsus* Guss., *diversipes* Guss., *metatarsalis* Guss., *sibiricus* Guss., *insularis* Giner Marí, *ceballosi* Giner Marí, and *marathroicus* DeStef.) undoubtedly constitute one or more discrete species groups within the nominate subgenus.

AMMOPLANUS (AMMOPLANUS) VANYUMI PATE

Ammoplanus (*Ammoplanus*) *vanyumi* Pate, Bull. So. Calif. Acad. Sci., XLI, p. 145, (1943); [♀ Mouth of Deep Creek (at junction with Mohave River), San Bernardino Mts., California; (on *Eriodictyon trichocalyx*)].

This species has hitherto been known only from southern California. The collection of the United States National Museum contains several specimens which materially extend the range of *vanyumi*.

IDAHO: Hollister, Twin Falls County; July 11, 1929; (on *S. altissimum* and *S. sophia*): 1 ♀. Burley, Cassia County; elevation, 4,350 feet; July 1, 1927; (on *Salsola pestifer*): 1 ♀. Oakley, Cassia County; elevation, 4,191 feet; July 1, 1927; (on *S. filipes*): 1 ♀.

[7] Jacques de Beaumont.—Systématique et croissance dysharmonique. Mitt. Schweiz. Ent. Ges., XIX, pp. 45-52, ill. (1943).

XYSMA CEANOTHAE (VIERECK)

Ammoplanus ceanothae Viereck [in part], Psyche, XI, p. 72, (1904).
Xysma ceanothae (Viereck) Pate, Trans. Amer. Ent. Soc., LXIII, p. 97, (1937); [♀; Lehigh Gap, Northampton County, Pennsylvania].

Hitherto this species has been known from only the unique female from eastern Pennsylvania. In the collection of the United States National Museum is another female specimen from Washington, D. C., bearing the manuscrpt name "*Ammoplanus foxii* Ashmead."

Like the species of the southern Californian genus *Timberlakena*, the hind wing of *Xysma ceanothae* lacks any closed cells.

LONGEVITY OF FIFTH INSTAR LARVAE OF HORNIA BOHARTI LINSLEY

In April, 1941, a large number of fifth instar larvae of *Hornia boharti* Linsley were collected in Grapevine Canyon, ten miles south of Little Lake, Inyo County, California[1]. Unlike the other known members of the genus, this species normally exhibits a two year life cycle, supposedly as a protective device useful in resisting the extreme dryness of its habitat and occasional poor flower years. Since all larval feeding takes place in the first four instars, these larvae had not fed since the summer of 1939 or 1940. They were stored in humidity chambers and during late spring and early summer, 1942, the majority transformed into sixth instar larvae, followed by pupation and adult emergence. At this time it was noticed that several dozen fifth instar larvae had undergone no further development but nevertheless appeared to be alive. These were subsequently kept at room temperatures and relative humidities and several adults emerged both in 1943 and 1944. These mated normally and laid large quantities of viable eggs. In June, 1945, the last three adults emerged and the single male mated with one of the two females. She subsequently deposited viable eggs. These three specimens appeared normal in every respect except for a distinct reduction in size. Similar small adults are occasionally encountered in the field and may also result from prolongation of the period spent as fifth instar larvae. In the present case the last adults transformed from larvae which had not fed for at least five and possibly six years.—E. G. LINSLEY AND J. W. MACSWAIN.

[1] Linsley, E. G. and J. W. MacSwain. 1942. Bionomics of the meloid genus *Hornia* (Coleoptera). Univ. of Calif. Publ. Entom., 7(9):189-206, pls. 6-7, 1 t. fig.

A NEW SPECIES OF CHYPHOTES FROM CALIFORNIA
(Hymenoptera, Mutillidae)

BY R. M. SCHUSTER
Cornell University, Ithaca, New York

In a collection of Mutillidae in the American Museum of Natural History there was found the following female of *Chyphotes*, representing a very distinct new species.

This species is the only one in the genus that has the entire head and thorax blackish in color, sharply contrasted from the bright orange abdomen. In the Monograph of the Genus *Chyphotes* of North America (Buzicky, Entomologica Americana, vol. 21, 1941, pp. 201-250) Buzicky gives a key to the females. The following species goes to couplet 7 in his key, and the key can be changed as follows in order to allow for its recognition:

7a. Head, thorax and legs entirely infuscated to black in color, the abdomen orange; third abdominal tergite concolorous with rest of abdomen; sculpture of abdomen very weak. .....*bicolor* Schuster

–. Head and thorax concolorous with the abdomen; if the legs are at all infuscated, the third abdominal tergite is also darkened, and the sculpture of the abdomen is rather coarse 7

This species appears to be closely related to *testaceipes* Fox and *auripilus* Buzicky, both of which have the head and thorax concolorous with the abdomen, however. It appears to be most closely related to the latter, from which it does not differ morphologically to any marked degree: however, Buzicky states that the head has the "punctures shallow but contiguous," whereas they are rather deep in the present species, and contiguous only on the lower frons.

Chyphotes bicolor Schuster, new species

Female. Length 8.2 mm. Head and alitrunk deeply infuscated and piceous to nearly black, the legs and antennae scarcely lighter (more or less mahogany colored), much darker than the orange abdomen. Notum of head, thorax and abdomen, with the exception of the apical three tergites and the propodeum, which are silvery

erect pubescent, entirely erect and appressed golden-yellow pubescent.

Head very closely to subconfluently punctured on the lower frons, the punctures more or less polygonal-rounded, those of the rest of the head distinctly separated, rounded, with polished intervals (those of the antennal scrobes considerably smaller than those of the rest of the head). Scape with coarse, scattered, well-separated foveate punctures, with wide polished intervals, with sparse, decumbent silvery and yellowish-golden hairs; pedicel slightly less than half as long as the first flagellar segment, which in its turn, is very slightly longer than the second (the ratio between the two, dorsally measured, 41:38). Mandibles, clypeus and genae with very sparse silvery, pilose hairs, the frons and vertex with a nearly circular cap of decumbent, appressed to erect light golden pubescence. Eyes subovate-subreniform, posteriorly angulate in outline, about one-sixth longer than high.

Thorax nearly black, with rather sparse, erect, very long, light golden pubescence dorsally; densely but not confluently punctured, similarly to vertex, the intervals polished. Mesopleurae punctate all over, the punctures of the anterior margin sparser, smaller and scattered, however. Mesosterna each with a short, subdentiform or carinate lobe or process between and close to the mesocoxae. Inner edges of the metasternal teeth with the sinus v-shaped, sides at somewhat less than 90 degrees to each other. Propodeum similarly punctured to the rest of the thorax laterally; the apical median area somewhat depressed and transversely wrinkled, while the median area immediately anterior is obscurely, rugosely sculptured.

Abdomen with the anterior part of the first sternite terete, glabrous, polished, not covered by tergite one, slightly widened to apex; meeting tergite one at a right angle or, if anything, at a slightly obtuse angle. Entire abdomen a bright golden orange, dorsally weakly, moderately closely punctured (the sculpture not more than half as coarse as in *elevatus*). Second sternite laterally coarsely punctured, medially (ie., on disk) with the punctures fine, scattered, nearly obsolete in part, the disk thus more or less polished. Felt line of second tergite short, about a fifth the length of the tergite. Vestiture of abdomen of silvery erect, long pilose hairs below; that of the notum similar, but bright golden, except for that of the apical two or three segments, where it is largely or entirely silvery.

Legs deeply infuscated, silvery pubescent.

Holotype, SAN DIEGO, CALIFORNIA, in the collection of the American Museum of Natural History.

UNDESCRIBED SPECIES OF TIPULIDAE FROM THE WESTERN UNITED STATES
(Diptera)

PART II

BY CHARLES P. ALEXANDER
Massachusetts State College, Amherst

The preceding part under this title was published in the Pan-Pacific Entomologist, 20:91-97; 1944. Most of the species described at this time are from the extensive Melander Collection, and were taken in Washington and northern Idaho by Dr. Melander. I wish to express my deep thanks to Dr. Melander for permitting me to retain the types of those species that were based on single specimens. All of the species discussed herewith belong to the single tribe Hexatomini, extensively developed in our western states.

Dactylolabis imitata Alexander, new species

Male. Length about 10 mm.; wing 10 mm.

Generally similar to *damula* and *pteropoecila*, differing conspicuously in the details of wing pattern and the venation.

Wings with the ground whitish subhyaline, the prearcular and costal cells clearer yellow; a heavy brown pattern, as follows: Postarcular, in bases of cells *R* and *M*, more extensive in the former; a major area at origin of *Rs*, continued across cells *R* and *M* to vein *Cu*, vaguely broken by a pale seam in cell *R* adjoining vein *M*; a relatively narrow but complete crossband at the cord; other major darkenings at R_{1+2} and R_2, the outer end of cell *1st* M_2 and the fork of M_{1+2}; a narrow, continuous brown seam along vein *Cu*, chiefly in cell Cu_1 and immediately behind vein Cu_2; a similarly narrow seam along vein *2nd A*; veins brownish yellow, darker in the patterned areas. Venation: *Sc* long, both Sc_1 and Sc_2 ending beyond the fork of R_{2+3+4}, the latter very short, subequal to or shorter than the basal section of *Rs*; cell *1st* M_2 large, *m* and the basal section of M_3 subequal in length; *m-cu* more than three-fourths its own length beyond the fork of *M*.

The most similar described species is *Dactylolabis pteropoecila* (Alexander) which has the wing pattern almost the same but much more restricted, and which differs in important venational details, as the longer R_{2+3+4}, the lengthened cell *1st* M_2, and the unusually long *m*. *D. damula* (Osten Sacken) is more

distantly related, differing particularly in the short *Sc*, strongly upcurved veins R_3 and R_4, and the position of *m-cu* before the fork of *M*.

Habitat. CALIFORNIA (MARIN COUNTY).

Holotype, ♂, LAGUNITAS CAÑON, March, 1939 (through Mont A. Cazier).

Limnophila (Prionolabis) scaria Alexander, new species

Allied to *vancouverensis*; size medium (wing, male, 9 mm.); general coloration heavily gray pruinose, the praescutum with indications of three darker stripes; antennae 16-segmented; femora brownish yellow, the tips broadly brownish black; wings brownish yellow, restrictedly patterned with brown; male hypopygium with the outer dististyle conspicuously toothed on mesal edge, the lowest of these teeth expanded into a flange; inner dististyle elongate-oval, terminating in a mass of spinous points, before apex on outer face with a short, stout, spinous lobe; gonapophyses slender-stemmed, at apex widening into an elongate blade that tapers gradually into a long spinous point.

Male. Length about 8.5 mm.; wing 9 mm.

Rostrum and palpi black. Antennae 16-segmented, black throughout, the scape pruinose; flagellar segments oval, the terminal one cylindrical, about one-fourth longer than the penultimate. Head black, heavily gray pruinose.

Pronotum gray. Mesonotum blackened, gray pruinose, but leaving indications of three opaque praescutal stripes, the median one broader; posterior sclerites of notum less heavily pruinose. Pleura black, gray pruinose; dorsopleural membrane restrictedly buffy. Halteres pale yellow throughout. Legs with coxae black, pruinose; trochanters brownish black; femora brownish yellow, clearer yellow basally, the tips passing into brownish black, including the distal third to fourth; tibiae and basitarsi obscure brownish yellow, the tips narrowly infuscated; remainder of tarsi black. Wings with a brownish yellow suffusion, the prearcular and costal fields clear light yellow; stigma oval, darker brown; relatively distinct, paler brown clouds at origin of *Rs*, over cord and outer end of cell *1st* M_2, as a seam along vein *Cu*, and as less evident cloudings on outer radial veins and *2nd A*; veins brown, yellow in the brightened fields. Venation: R_{2+3+4} a trifle longer than *m–cu* or approximately twice *r–m*; R_{2+3} weakly sinuous; petiole of cell M_1 subequal to the cell; *m–cu* at near midlength of cell *1st* M_2.

Abdominal tergites brownish black, more infuscated medially, the darkest color being on the lateral and posterior portions of the individual segments; basal sternites more reddish brown, the outer segments, including hypopygium, more uniformly blackened. Male hypopygium with the tergite rather deeply notched, the lobes obtuse at tips, the entire caudal emargination and lobes provided

with microscopic setulae from small papillose bases. Outer dististyle with its mesal edge conspicuously toothed, on the more basal portion dilated into a flange; outer surface of style microscopically squamose; outer lobe closely appressed to the style. Inner dististyle generally elongate-oval in outline, without a clearly defined basal lobe as is common in the subgenus; style narrowed outwardly, the entire apex produced and densely beset with strong black spines, those on the ventral aspect longer and stouter, on the outer margin small and appressed but stout, interspersed with a few long setae; on outer margin before the spinous tip a short lobe that terminates in an acute spine. Gonapophyses slender-stemmed, at apex widened into an elongate blade that tapers gradually into a long spinous point. Aedeagus broadly flattened.

Habitat. WASHINGTON (SNOHOMISH COUNTY).

Holotype, ♂, INDEX, August 2, 1917 (Melander).

Although generally similar to *Limnophila* (*Prionolabis*) *vancouverensis* Alexander, there seems to be no question of the specific distinctness of the present fly. It differs evidently in the structure of the male hypopygium, particularly of the inner dististyles and the gonapophyses.

Limnophila (Prionolabis) gruiformis Alexander, new species

Size medium (wing, male, 10 mm. or less); general coloration gray, the median praescutal stripe more blackened; antennae 16-segmented, the more proximal flagellar segments with lower face slightly protuberant; femora yellow, the tips narrowly brownish black; wings yellowish, the stigma and seams over *Cu*, cord and outer end of cell *1st* M_2 darker; male hypopygium with the tergal lobes slightly divergent and microscopically scabrous; outer dististyle narrow, with only a single well-developed denticle before the long apical spine; inner dististyle with a long blackened rod on outer face, teeth of outer portion of style along outer margin conspicuously appressed; gonapophyses with the stems rather strongly sclerotized, near tip narrowed into a slender spine that is bent at a slight angle; aedeagus broadly flattened.

Male. Length about 8:5-9 mm..; wing 9.5-10 mm.; antenna about 1.9-2.0 mm.

Rostrum and palpi dark brown. Antennae 16-segmented; scape and pedicel brownish black, the former more or less pruinose; flagellum brown, the outer segments somewhat darker; basal flagellar segment pyriform, succeeding segments short-suboval, the lower face somewhat protuberant; intermediate segments oval, the outer ones passing into long-cylindrical; terminal segment about one-third longer than the penultimate. Head gray.

Pronotum dark gray. Mesonotum chiefly gray, the praescutum with the broad median stripe more blackened and defined, less

heavily pruinose to subnitidous; posterior sclerites of notum less heavily pruinose, posterior portions of scutal lobes reddened. Pleura black, heavily gray pruinose; dorsopleural membrane gray in front, more buffy yellow behind. Halteres yellow. Legs with the coxae gray pruinose; trochanters obscure yellow, more blackened apically and beneath; femora yellow, the tips rather narrowly brownish black; tibiae and basitarsi obscure yellow, the tips more narrowly darkened; remainder of tarsi blackened. Wings with the ground color yellowed, the prearcular and costal fields clearer yellow; stigma long-oval, dark brown; less evident dark seams along cord, outer end of cell *1st* M_2 and along vein *Cu*; veins brown, yellow in the luteous fields. Venation: R_{2+3+4} longer than the basal section of R_5; petiole of cell M_1 subequal to or longer than the cell; cell *1st* M_2 varying from rectangular to long-rectangular, with *m-cu* at from one-third to beyond midlength.

Abdomen black, gray pruinose, hypopygium concolorous. Male hypopygium with the median region of tergite slightly produced, with a broad U-shaped median notch, the lateral lobes microscopically scabrous, slightly divergent. Outer dististyle with its outer portion narrow, with only a single strong denticle, with indications of a second low point before midlength to the tip of the strong terminal spine. Inner dististyle with a long black rod on outer face, this subequal in length to the remainder of the style beyond it; the latter with a series of about ten low appressed black teeth along the outer margin; a conspicuous fleshy lobe on mesal face at base. Gonapophyses with stem rather strongly sclerotized, straight, slightly widened outwardly, near apex narrowed into a long slender spine that is bent at a slight angle from the axis. Aedeagus broadly flattened.

Habitat. IDAHO (LATAH COUNTY).

Holotype, ♂, MOSCOW MOUNTAIN, July 7, 1918 (Melander) Melander Collection. *Paratopotype*, ♂, in author's collection.

Limnophila (Prionolabis) gruiformis is well-distinguished from other similar regional species by the structure of the male hypopygium, particularly the tergite, both dististyles and the gonapophyses. The inner dististyle and gonapophysis are somewhat as in the eastern Nearctic *L. (P.) walleyi* Alexander but the structure of the outer dististyle is quite distinctive.

Limnophila (Phylidorea) snoqualmiensis Alexander, new species

General coloration of thorax varying from reddish brown to brownish black, the surface more or less pruinose; fore femora extensively blackened, the remaining femora with only the tips darkened; wings with a very restricted dark pattern; abdominal tergites yellowish brown, sternites clear yellow, the outer segments

extensively black; male hypopygium with the tergite produced into two small darkened lobes, one on either side of a deep medium notch; inner dististyle unusually slender, not angularly bent at near midlength; lateral gonapophyses long and slender, narrowed to the simple tips.

Male. Length about 9.5 mm.; wing 10 mm.

Rostrum and palpi black. Antennae with scape black, pedicel yellowish brown, flagellum pale brown; flagellar segments passing through long-oval to subcylindrical, provided with long conspicuous verticils. Head uniformly gray; anterior vertex about three times the diameter of scape.

Thoracic notum of type almost uniformly blackened, sparsely pruinose, pleura concolorous, the propleura paler; in paratype, color much more reddish brown, sparsely pruinose or pollinose, giving a brown or fulvous brown appearance. Halteres with stem whitened, knob weakly darkened. Legs with coxae and trochanters reddish yellow; femora yellow basally, the tips blackened, very broadly so on fore legs where the outer three-fourths to four-fifths is included, narrow on the middle and posterior legs, involving the outer eighth to tenth; all tibiae obscure yellow, the tips very narrowly darkened; tarsi passing through light brown to brownish black. Wings whitish yellow, the prearcular and costal fields light yellow; stigma relatively small but conspicuous, dark brown; very narrow and inconspicuous brown seams over cord and outer end of cell *1st* M_2; wing tip very vaguely infuscated; veins brown, more yellowed in the brightened portions. Venation: *Rs* short and angulated to more elongate and arcuated, the greatest length (type) about three times R_{2+3+4}; cell M_1 subequal to its petiole; *m-cu* at or near midlength of cell *1st* M_2.

Abdominal tergites yellowish brown, sternites clear yellow, the outer segments, involving seven, eight and part of nine, uniformly blackened to form a ring, the remainder of hypopygium chiefly castaneous. Male hypopygium with the median region of posterior border of tergite bearing a small oval darkened lobe on either side of a deep median incision, the lobes abundantly setuliferous; lobes subtended on either side by a glabrous, more reddish flange; no concentration of setae near the caudal border, as in *adusta* and allies. Outer dististyle flattened, glabrous, slightly expanded before the abruptly narrowed apical portion. Inner dististyle unusually slender, strongly curved, not angularly bent at near midlength as in related species. Lateral gonapophyses long and slender, blackened, gradually narrowed to the simple tips. Inner paired gonapophyses or branches of adeagus blackened, not expanded at their tips.

Habitat. WASHINGTON (KITTITAS COUNTY).

Holotype, ♂, SNOQUALMIE PASS, June 29, 1924 (Melander); Melander Collection. *Paratopotype,* ♂, in author's collection.

The present fly is closely related to *Limnophila* (*Phylidorea*)

columbiana Alexander, of northwestern British Columbia, differing especially in the details of structure of the male hypopygium, particularly the tergite, where the lobes are deeply divided, and the lateral gonapophyses, which are more slender, tapering to the acute tips. In this subgenus, what both Edwards and I had interpreted as being the innermost set of gonapophyses now appears to represent lateral branches of a profoundly trifid aedeagus. Several groups of Tipulidae are now known with this organ deeply bifid or trifid.

Shannonomyia albomanicata Alexander, new species

General coloration of thorax brownish yellow, without pattern; femora obscure yellow, tips narrowly infuscated; tarsi snowy-white; wings with a strong brownish-yellow suffusion; Sc_1 ending about opposite six-seventh the length of the long *Rs*, the latter subequal to vein R_1; inner ends of cells R_1, R_5 and *1st* M_2 in transverse alignment; cell M_1 lacking.

Female. Length about 6 mm.; wing 6.2 mm.

Rostrum and palpi brown. Antennae brown, the flagellum somewhat lighter colored; flagellar segments oval, the terminal one elongate, nearly twice the penultimate; verticils slightly exceeding the segments. Head dark brownish gray.

Thoracic dorsum light brownish yellow, without pattern, the lateral margins somewhat brighter; pseudosutural fovea and tuberculate pits pale, concolorus with the integument, the latter placed near the cephalic border of praescutum. Pleura a little more yellowish, the surface with a vague pruinosity. Halteres elongate, stem yellow, knob weakly infuscated. Legs with the coxae and trochanters yellow; femora obscure yellow, the tips narrowly and inconspicuously infuscated; tibiae pale yellow, the tips even more narrowly darkened; tarsi snowy-white, the terminal segment darkened; tibiae spurred. Wings with a strong brownish yellow suffusion, the prearcular and costal fields clearer yellow; veins brownish yellow, clearer yellow in the more brightened fields. Macrotrichia on veins beyond cord, lacking on *Rs*, R_{2+3} and on most of the veins enclosing cell *1st* M_2. Venation: *Sc* short, Sc_1 ending about opposite six-sevenths the length of the long *Rs*, the latter subequal to vein R_1; R_{2+3+4} short, a little exceeding the basal section of R_5; R_2 faint, subequal to R_{1+2}; inner ends of cells R_1, R_5 and *1st* M_2 in transverse alignment; cell M_1 lacking; cell *1st* M_2 long, narrowed outwardly, *m* being only about one-half the basal section of M_3, the cell a trifle longer than vein M_3 beyond it; *m-cu* at three fifths the length of M_{3+4}.

Abdomen light brownish yellow, the sternites somewhat clearer yellow. Ovipositor with valves long and slender, the cerci straight and unusually long.

Habitat. WASHINGTON (PACIFIC COUNTY).
Holotype. ♀, ILWACO, June 28, 1925 (Melander).

The reference of this curious fly to *Shannonomyia* Alexander must be held to be somewhat provisional but on the basis of the short subcosta and the loss of cell M_1, it agrees more closely than with *Limnophila.* The one discordant venational feature is the long *Rs* which is much longer than in the other described Nearctic species. The discovery of the male sex may result in assigning the species elsewhere. The fly is readily told from all other regional species of Hexatomini by the white tarsi, in conjunction with the loss of cell M_1 of the wings.

NOTES ON THE HABITS OF THE PREDATOR CYMATODERA OVIPENNIS SAY WITH A DESCRIPTION OF THE PUPA

(Coleoptera, Cleridae)

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During a study of the aculeate Hymenoptera using the living and dead branches of *Sambucus* for nesting purposes, two beetle larvae were found that proved to be *Cymatodera ovipennis* Say.[1] Blaisdell (1892) has recorded larvae of this species from burrows of the cerambycid *Ipochus fasciatus* in southern California. A summary of the food habits of this species by Böving and Champlain (1920) states that it is "a predator on Lepidopterous larvae infesting cones of *Pinus jeffreyi*; reared from cones of *Pinus ponderosa* and *Pseudotsuga taxifolia*; from Piñon pine infested with *Carphoborous* and *Callidium.*" These records on secondary woodboring Coleoptera are similar to those given by the same authors for *Cymatodera undulata* Say, which was subsequently reared by W. V. Balduf (1926) from the bur oak galls made by the cynipid, *Disholcaspis mamma* Walsh. This paper is designed to increase the knowledge of the biology of this species and to illustrate and describe the pupa.

[1] Determination by E. G. Linsley.

Larva

An excellent description of the mature larva has been given by Böving and Champlain. It will suffice to add that, following ecdysis and in earlier instars, the general body color of the larva is pale rose and the pigmented portions a pinkish violet. In the ultimate and penultimate larvae, the membraneous portions of the thorax and abdomen have a distinct greenish color which in Böving and Champlain was described as *clay yellow*. This discrepancy is undoubtedly due to the fact that their description was based on larvae which had been preserved in alcohol.

Pupa (fig. 1)

Head with four spines forming a single row on upper portion of face. Pronotum with a row of ten stamineous spines along anterior margin, five spines along each margin, a series of seven spines just anterior to the mid-line with the two on each side of the center caudad to the rest of the series, an inverted triangle of three spines in the posterior half. Legs with an anterior femoral spine three-fourths of the distance from the base to the apex, each pair also with a spine on the posterior margin of the femur, the intermediate pair of legs with a second adjacent spine. Abdomen with a small group of median lateral spines, a single pair of spines on the posterior margin of each tergite and one on each side of the mid-dorsal line, each pair increasing in length from anterior to posterior.

When first formed, color entirely white, head folded under the prothorax. After seventh day, eyes light brown, head and notum evenly flecked with irregular purple spots, dorsal and lateral margins of abdomen heavily pigmented with purple with the exception of a thin mid-dorsal line which is green, ninth abdominal segment and caudal appendages white. Mandibles, labial palpi, maxillae, maxillary palpi, clypeus, antennae, legs and wings all white until fifteenth day. First brown pigmentation of tips of mandibles on fifteenth day following pupation, tarsal claws pigmented on eighteenth day, mouth parts and all appendages becoming increasingly suffused with brown from twentieth to twenty-fifth day. Emergence on twenty-fifth day.

Judging from the pupal description given by Balduf for *Cymatodera undulata* Say, the spine pattern may prove to be the easiest method of separating pupae of this genus.

Cymatodera ovipennis has been found at elevations of several hundred to seven thousand feet throughout Western North America. The adults are nocturnal and are most frequently taken in light traps or at light during the summer months.

The first two specimens which were encountered in this study were collected in the dead branches of *Sambucus* at Mineralking, Tulare County, California, August 10, 1939, by G. E. Bohart.

Fig. 1. Pupa of *Cymatodera ovipennis* LeConte, X 6½.

Two larvae were obtained from a total of over three hundred twigs, which were being used by numerous aculeate Hymenoptera for nesting purposes. One had fed on a cell series of *Hoplitis* (*Alcidamia*) sp. and then constructed a resting cell in the pith of the twig to one side of the bees burrow. This larva was placed in a large shell vial with a cork stopper. Within a few days the larva had cut a small circular hole in the cork and hollowed out a pupal cavity. This cell was constructed so as to leave only a very thin, almost membranous, shell of cork separating it from the external environment. Similar behavior was reported by Linsley and MacSwain (1943) for *Trichodes ornatus*. The cork was later split open and reinserted in the vial to allow frequent observations. On each examination the larva became

active but no change was observed for almost two years. Pupation finally occurred on July 9, 1941, and the adult emerged on August 8, 1941. The second larva was found in a twig containing the remnants of a cell series of *Osmia* sp. This larva was provided with a similar environment, but pupation had not occurred by August, 1941, although a larval skin was shed on March 18, 1941. This specimen was killed and preserved for future study.

Other specimens were obtained as follows: one dead adult and larval skins from a dead branch of *Sambucus* containing destroyed cells of *Osmia* sp. at Mt. Diablo, Contra Costa County, California, on July 10, 1940, two larvae (one immature) and one pupa in the dead branches of *Sambucus* containing old cell series of *Ceratina acantha submaritima* (Ckll.) at Kyburz, El Dorado County, California, July 26, 1941, and one dead larva in *Sambucus* containing old series of *Osmia* sp. at Mt. Rose, Washoe County, Nevada, July 27, 1941.

The normal duration of the life cycle of this species remains a matter for conjecture, but from the material at hand, it would seem likely that it involves one or more years, with larval feeding confined to the first year. All attempts to feed larvae after they had constructed their resting cells were unsuccessful.

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NEW SPECIES OF NORTH AMERICAN COLEOPTERA

BY EDWIN C. VAN DYKE
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CARABIDAE

Trechus humboldti Van Dyke, new species

Rather small, robust yet gracefully formed, rufopiceous with antennae, legs and ventral surface rufous. *Head* broadly elevated at middle, bounded laterally by deep arcuate sulci, the occiput smooth or very minutely rugose posteriorly, the eyes moderately prominent, and antennae somewhat moniliform and reaching behind base of prothorax. *Prothorax* about as broad as long, cordiform, apex emarginate, sides arcuate in front, sinuate behind with hind angles right angled, margin rather broad, reflexed and wider behind, disk convex, smooth and shining, with deep median longitudinal groove extending from anterior transverse impression to base, and with a broad and deep impression within each hind angle. *Elytra* oval, about twice as wide as prothorax, moderately convex, with seven striae, the four inner ones deeply impressed, complete and distinctly punctured, the outer ones feebler, and two small foveae on third striae, one near base, the other at middle. Beneath smooth and shining. Length 4.5 mm., breadth 2 mm.

Holotype (No. 5434, Mus. Calif. Acad. Sci., Ent.), a unique male, collected by myself in the dense redwood region near ORICK, HUMBOLDT COUNTY, CALIFORNIA, July 5, 1931.

This very graceful species probably belongs to the group with *ovipennis* but it differs from it and its relatives by having a longer and cordiform prothorax, quite transverse in *ovipennis*, the elytra more distinctly oval, quite elliptical in most *ovipennis*, and very distinctly and deeply striate on the disk. Though most specimens of *ovipennis* have been collected in the San Francisco Bay region, it does extend along the coast as far north as British Columbia and of course is to be found in Humboldt County. Specimens of a phase of *Trechus chalybaeus* Mann., a more northern species, have also been collected only a short distance north of Orick, at Crescent City.

Badister mexicanus Van Dyke, new species

Moderate in size, black, antennae, legs and mouth parts testaceous; narrow side margin of prothorax and elytra, as well as epipleurae somewhat rufous, head and pronotum alutaceous and somewhat dull, the elytra shining and irridescent. *Head* with eyes quite prominent, the antennae reaching three segments beyond hind margin of prothorax. *Prothorax* about twice as wide as long, almost one-fourth broader than head, apex emarginate, sides arcuate in front, straight and converging behind, the hind angles obtuse, feebly rounded, the lateral margin narrow and slightly reflexed; the disk with median longitudinal line deeply impressed, the anterior transverse impression quite evident and the posterior impressions extensive. *Elytra* about one-fourth longer than broad, a third broader than prothorax, base emarginate, sides almost straight and feebly divergent to posterior fourth, thence gradually rounded to apex; the disk feebly convex, all striae complete and well impressed, the intervals flat, second striae with two vague foveae and the marginal striae with numerous punctures. Beneath smooth and shining. Length 5.5 mm., breadth 2.75 mm.

Holotype female (No. 5435, Mus. Calif. Acad. Sci., Ent.) a unique specimen collected at Oaxaca, Mexico, July 20, 1937, and received from the collector, M. A. Embury.

This species, the first of the genus to be found in Mexico, would appear to be most closely related to our well-known *micans* Lec. It differs from the latter by being more robust, proportionally broader, with the elytra less parallel-sided, the antennae not at all piceous, the lateral lighter colored margins of both prothorax and elytra narrower and the elytral striae more deeply impressed.

Monotomidae

Hesperobaenus fenyesi Van Dyke, new species

Elongate, subdepressed, rufous, antennae and legs lighter in color, the entire upper surface alutaceous. *Head* flattened above, rather coarsely, closely punctured, eyes moderately prominent, with sides behind eyes parallel to posterior constriction. *Prothorax* slightly longer than broad, disk feebly convex, the coarse punctures approximately their own width apart, sides straight or very feebly arcuate and convergent to base, with margin crenulated, the base finely margined. *Elytra* over twice as long as broad, about one-fourth longer than forebody and perceptibly broader, striae finely, sharply impressed and rather finely punctured, the punctures their own width apart in general and with short recumbent setae arising from them, the intervals broad and

flat. Beneath rather finely, sparsely punctured in front and behind more coarsely punctured on the metapleurae. Length 2.75 mm., breadth 1 mm.

Holotype (No. 5436, Mus. Calif. Acad. Sci., Ent.) and seven paratypes from PASADENA, CALIFORNIA, six collected in March and two in July, by Dr. Adalbert Fenyes. Besides these specimens in the Fenyes collection, we have in the Academy collection, three from SIERRA MADRE, LOS ANGELES COUNTY, February 17, 1909, in the Van Dyke collection, one from POWAY, SAN DIEGO COUNTY, in the Blaisdell collection, and one from the PLACER RANGER STATION, MADERA COUNTY, collected on *Alnus rhombifolio* by E. F. Wohletz.

This species superficially resembles *Hesperobaenus rufipes* Lec. from the eastern part of the country. It differs by being in general a bit smaller, by having the sides of the head back of the eyes parallel, not prominently angulated, the prothorax evidently longer than broad, with sides less parallel, and the elytra more finely striato-punctate. It seems to be dominantly a southern California species that has apparently been overlooked. Our other species in the genus are all more or less bicolored like the common Pacific Coast *abbreviatus* Mots.

MELASIDAE

Hylus (Hypocoelus) arizonicus Van Dyke, new species

Robust, somewhat elongate, subparallel; coal black, subopaque, apex of last antennal segments and tarsi rufous, the upper surface clothed with a rather sparse, very short, closely appressed pile, only evident on good magnification. *Head* convex, with a slight transverse impression forwards, sulcate between the eyes, clypeus narrowed at base and transversely impressed at middle, the entire head finely, densely, umbilicately punctured and alutaceous; antennae about reaching hind angles of prothorax, rather robust, second segment small, third long, about one and a half times as long as broad, segments 4 - 6 short and transverse, 7 - 8 somewhat broader, and 9 - 11 considerably broader and longer, forming an elongate club, the tenth the shortest and the eleventh acute at apex; the eyes moderately prominent. *Prothorax* slightly broader than long, apex transverse, sides straight and parallel behind, arcuate from middle and gradually convergent towards apex, base bisinuate and hind angles acute, prominent and extending backwards; the disk convex, with a well impressed median longitudinal line, the surface rather finely, densely umbilicately punctured and alutaceous, the base with a definite margin. *Elytra*

with striae well impressed, the strial punctures more or less vague, the intervals feebly convex and finely rugose. Beneath densely punctured, more coarsely in front and more finely behind and alutaceous. Hind coxal plates triangular. Length 7 mm., breadth 2.5 mm.

Holotype, presumably a male (No. 5437, Mus. Calif. Acad. Sci., Ent.) a unique collected by myself high up in the CHIRICAHUA MOUNTAINS, ARIZONA, July 16, 1942.

This very distinct species is one of our larger species, but little smaller than the recently described *robustus* Van Dyke. It may be readily distinguished from all of our species by its size, its coal black color, and rather short antennae which have the three terminal segments gradually though definitely enlarged so as to form an elongate club.

BUPRESTIDAE

Acmaeodera lagunae Van Dyke, new species

Robust, cuneiform, moderately flattened, aeneous, the elytra generally with a more greenish lustre than the forebody though often the reverse, upper surface moderately clothed with rather long, erect, dark pile, the under surface with a sparser, more depressed, gray pile; the pronotum immaculate, the elytra with variable markings though the general pattern is as follows: the third and fifth intervals spotted with yellow at base, the third usually with a few adidtional scattered spots, the lateral interval yellow for at least its basal third but the marking not quite reaching the basal margin, and from three to four conspicuous transverse maculations, the largest at the middle, irregular, and extending inwards to about the fifth interval, a narrower one, one-half the distance between this and apex, and one to two smaller, often interrupted maculations between this latter and apex. *Head* coarsely, densely punctured, longitudinally impressed at middle; antennae extending beyond middle of prothorax, segments 5 - 11 moderately serrate. *Prothorax* somewhat more than twice as broad as long, expanded at the posterior third where broader than elytra; the disk coarsely punctured, the punctures well separated at center, approximate laterally, a broad, somewhat triangular, longitudinal impression at center and moderately well impressed foveae between this and basal angles, the lateral margin well developed, completely, feebly reflexed, yet because of incurving not seen near base when viewed from above. *Elytra* moderately flattened, striae only distinctly impressed at sides and towards apex, strial punctures coarse and closely placed at sides, much finer and better spaced near suture, the intervals on disk flat and with a few fine, scattered punctures, the third and fifth often elevated near base,

the humeral umbone also prominent, the lateral intervals generally quite convex especially posteriorly. Beneath, but moderately, rather sparsely punctured in front, more coarsely and densely on posterior ventral segments. *Prosternum* feebly retracted and bisinuate at apex, last ventral with distinct, transverse plate near apex. Length, type, 10 mm., breadth 4 mm., length in series varies from 7 mm.-11 mm. and breadth from 2.5 mm-4 mm.

Holotype (No. 5438, Mus. Calif. Acad. Sci., Ent.) and numerous designated paratypes from a series of sixty-five specimens, collected by E. S. Ross and G. Bohart, at LA LAGUNA, SIERRA LAGUNA, LOWER CALIFORNIA, October 14, 1941.

This species is undoubtedly related to *Acmaeodera scapularis* Horn and the larger specimens closely simulate it, and both are confined to the Cape Region of Lower California. *Acmaeodera lagunae* differs from *scapularis* by being proportionally less broad in front, by having the prothoracic margin complete and by never having a yellow spot near its base, by having the pronotal impressions far less pronounced, the fifth elytral interval never carinate as it is in *scapularis* and the strial punctures never as coarse near the suture as they are in the other, where all strial punctures are quite similar, very coarse and approximate. The color pattern is quite similar but the median bar is generally very broad in *scapularis*. The color pattern of *Acmaeodera flavostica* Horn is even closer but this species is proportionally shorter and belongs in another group.

Acmaeodera transversa Van Dyke, new species

Elongate, subcylindrical, of moderate size, black, elytra feebly bronzed, pronotum immaculate; elytra with a short, transverse yellow bar near base extending from second to sixth interval, a narrow transverse yellow bar extending from the second to eighth interval situated at the middle, a narrow oblique yellow bar extending from the third to sixth interval, midway between preceding and apex, a short transverse spot, also yellow, extending from second to fourth interval, a short distance in front of apex, a small elongate yellow spot behind the humeral umbone and a bright red spot of fair size at the outer extremity of the oblique bar which extends outwardly from the eighth to the eleventh or marginal interval. *Head* with well spaced, rather coarse punctures, a feeble longitudinal impression at middle, antennae short, barely reaching middle of prothorax, segments 5 - 11 serrate, and with short, sparse, semierect gray pile. *Prothorax* one-third broader than long, a little narrower than base of elytra, apex feebly biemarginate, sides moderately arcuate, gradually narrowing from

base to apex, the lateral margin narrow, not readily visible when viewed from above because of the bulging sides of pronotum and dense pile placed along the sides, the disk convex, rather coarsely and densely punctuated medially, with a sparse, semierect pile above and a patch of dense, white pile along the lateral margin. *Elytra* twice as long as broad, sides sinuate before the middle, and gradually narrowed posteriorly to blunt apex; the disk feebly convex, humeral umbone moderately prominent, the striae well impressed and rather coarsely, densely punctured in front and more finely punctured behind as well as confined to the striae; the intervals towards suture flattened, and convex towards sides and with a single row of fine punctures, from which arise very short gray setae, most evident apically. Beneath moderately coarsely, densely punctured on prosternum, very coarsely punctured on propleurae, more finely on abdomen, sparsely in front and densely behind, the apical segment with a short, transverse plate in front of apex, the center of all abdominal segments quite smooth and naked while the sides are clothed with a dense, silky, white pile as are also the meso and metapleurae. *Prosternum* at apex, feebly retracted, the center emarginate and with a prominent tooth on each side of the emargination. Length 8 mm., breadth 3 mm.

Holotype (No. 5439, Mus. Calif. Acad. Sci., Ent.), a unique collected at Las Animas, Sierra Laguna, Lower California, October 12, 1941, by E. S. Ross and G. Bohart.

This very distinct, quadribalteate species probably belongs in the second or sinuate series of the *Acmaeodera*. It, however, stands more or less apart, its black or feebly metallic color, subcylindrical form, short, sparse elytral setae, and dense white pubescence at the sides of the ventral segments as well as the brilliant red spot at the sides of the elytra posteriorly, giving it a distinctive appearance.

Acmaeodera nautica Van Dyke, new species

Moderately elongate, somewhat flattened and cuneate; a bright blue above, the elytra ornamented with yellow as follows: a yellow line on the marginal interval just back of the humerus, a broad spot extending from the sixth interval to margin, at middle, a narrow transverse bar extending from the fourth interval to margin, half way between middle and apex, and two small marginal spots, one very small, in front of the last and another, somewhat larger near apex; the upper surface sparsely clothed with dark, erect pile, the under surface with much sparser, somewhat inclined gray pile. *Head* rather coarsely, densely punctured, feebly longitudinally impressed at middle; antennae reaching middle of prothorax, segments 5 - 11 serrate. *Prothorax* over twice as broad as long, slightly expanded in front of base where somewhat broader than

elytra, apex feebly biemarginate, sides subangulate, almost parallel behind, straight and convergent in front, the margin distinct, slightly reflexed, complete and readily seen from above; the disk coarsely, cribately punctured at sides, less coarsely and densely medially, the median longitudinal impression well marked, the basal impressions small, foveiform, and distant from the hind angles. *Elytra* about twice as long as broad, sides feebly sinuate in front of middle, and feebly arcuate and gradually narrowed to blunt apex; the disk somewhat flattened with a moderate depression at base near suture, the humeral umbones distinct, the striae finely, sharply impressed at middle and finely, rather closely punctured, more broadly and deeply impressed at sides and with the punctures coarser, the intervals medially flattened and with a row of fine, well spaced punctures along their middle, the intervals at the sides quite convex. Beneath, a bluish black color, coarsely, rather densely punctured in front, very finely and sparsely on the abdomen. *Prosternum* feebly retracted in front, the shallow median emargination without marginal teeth. The last ventral segment without evident ventral plate near apex. Length 11 mm., breadth 4 mm.

Holotype (No. 5440, Mus. Calif. Acad. Sci., Ent.), a unique collected near LAFAYETTE, CONTRA COSTA COUNTY, CALIFORNIA, September 3, 1943, and submitted by Dr. E. G. Linsley.

This attractive species, because of its bright blue color, at first sight suggests *mariposa* Horn, but because of its shape and color pattern appears to approach more closely to *prorsa* Fall. The yellow maculations are of similar size and similarly placed. The species differs, though, from *prorsa* not only by being blue instead of bronze, but by being proportionally a bit shorter, with the prothorax less widely expanded, and the punctuation of the median areas of both pronotum and elytra far less coarse and dense.

Agaeocera gentilis peninsularis Van Dyke, new subspecies

This subspecies agrees with typical *gentilis* in regard to most fundamental characters but differs by being a little bit more robust and proportionally broader, of a dark bronze or cupreous color, both above and beneath, not a bright green as in *gentilis*, by having the head and pronotum more distinctly alutaceous and much more coarsely punctured and rugose, and the elytral intervals quite distinctly elevated and carinate towards suture and apex. Length 13 mm., breadth 5 mm; paratype length 16 mm, breadth 6 mm.

Holotype (No. 5441, Mus. Calif. Acad. Sci., Ent.), a specimen collected 15 miles N. of SAN IGNACIO, LOWER CALIFORNIA, Sep-

tember 29, 1941, and paratype, from TODOS SANTOS, LOWER CALIFORNIA, October 10, 1941, both collected by E. S. Ross and G. Bohart.

Most records that I have seen for typical *gentilis*, give western and southwestern Texas as its habitat. Sharp in the "Biologia Centrali-Americana," gives Coahuila and Villa Lerdo in Durango, Mexico. In the collection of the California Academy of Sciences, besides twelve Texas specimens, mostly from near El Paso, we have one from Grant County, N. Mexico (Coll. by R. T. Kellogg), and Mexican specimens from Lerdo (Fenyes Coll.) Torreon and Villa Juarez (Coll. by M. A. Embury). Near El Paso, I collected several specimens on a species of mallow. I know of no specimens from Arizona or the west coast of Mexico, though the very distinct *Agaeocera scintillans* Water. is found in southern Arizona, Sabino Canyon, as well as on the west coast of Mexico, the states of Sonora and Sinoloa, thus apparently wedging in between the two phases of *gentilis*. In time we may find that the two are in reality, geographically separated. In that case, we would be justified in elevating *peninsualris* to specific standing, but until we get more material, I feel that it is best to keep them as phases of the same species.

Since my review of the Buprestidae of Lower California (Proceed. Calif. Acad. Sc., Vol. 24, pp. 97-132, 1942), a second expedition has been made to that region by Dr. E. S. Ross, this time accompanied by George Bohart. This expedition besides securing the two new *Acmaeodera*, *lagunae* and *transversa*, described in the preceding pages, and the new subspecies of *Agaeocera*, added a number of new records to our list of Buprestidae from Lower California. They are as follows:

Acmaeodera flavomarginata Gray. San Pedro, 15 miles N. of San Ignacio, Las Animas, Sierra Laguna, San Venacio, and 20 miles N. of Comondo.

Acmaeodera scapularis Horn. Las Animas, San Venacio and Agua Caliente.

Acmaeodera gibbula Lec. Las Animas and 15 miles S. of San Domingo.

Acmaeodera clausa Horn. Pescadero.

Acmaeodera opinabilis Fall. Big Canyon, Sierra Laguna.

All of the above localities are in Lower California and all specimens collected in these localities were by Ross and Bohart and during October, 1941.

Additions to the Lower California list of species, overlooked in my previous paper, are:

Paratyndaris olneya (Skinner), 15 miles S. of San Domingo (Ross and Bohart Coll.). This species has generally been collected in various places in southern Arizona and several were taken at Jacumba, San Diego County, California, by W. F. Barr.

Paratyndaris albofasciata Knull, 25 miles S. of Santa Rosalia (Ross and Michelbacher Coll.). The type locality for this species is Tucson, Arizona.

Taphrocerus schaefferi Nicolay and Weise, Big Canyon, Sierra Laguna. (Ross and Bohart Coll.). This species has previously been collected in Southern Arizona, in the State of Sonora, Mexico, and on various islands in the Gulf of California as Santa Isabella Island (Academy Expedit. 1932).

MIGRATION OF *VANESSA CARDUI* (LINN.)

The following observations on the spring movement of the painted lady, *Vanessa cardui* (Linn.), were made during 1945. For a fuller account of the habits of this butterfly see Williams (1930, The Migration of Butterflies xi - 473 pp. Oliver and Boyd, London). On April 16, 1945, adults of *Vanessa cardui* were observed flying in a northeasterly direction at numerous points in the vicinity of Mt. Diablo, Contra Costa County, California. No massed flights were observed but all individuals were flying in the same general direction. At a point 5 miles south of Antioch counts were made of the numbers passing a single station. The weather was clear and a breeze was blowing rather briskly from the northwest. At 3:00 p.m., 48 specimens passed a line about 70 yards wide in ten minutes. Another count along a road gave 26 specimens passing a line 100 feet wide. Most individuals were flying two to four feet above the ground although a few flew as high as twenty feet. They were flying approximately 20 m.p.h. Most of the specimens were worn. On April 23 the numbers were considerably reduced and by April 26 only an occasional specimen could be seen flying.—RAY F. SMITH AND E. GORTON LINSLEY.

FURTHER NOTES ON SOME SPECIES OF PLEOCOMA
(Coleoptera, Scarabaeidae)

BY E. GORTON LINSLEY
University of California, Berkeley

Pleocoma venturae Linsley, new species

Male: Form large, robust, broadly oblong-oval, only moderately convex; integument mostly dark or reddish-brown; pubescence golden yellow. *Head* coarsely punctate, with a broad smooth band extending from antero-basal angle of ocular canthi to base of vertical horn; clypeus moderately coarsely, irregularly punctate, clothed with long erect hairs, anterior process with anterior face nearly vertical, slightly concave, apex deeply, obtusely notched, apical angles moderately acute; vertical horn elongate, gradually narrowed toward apex, apex with a broadly arcuate notch, surface clothed with long hairs; ocular canthi projecting forward slightly from a right angle, anterior margin slightly concave; palpi and antennae reddish, lamellae brownish, scape conical, about twice as long as apical width, second segment moniliform, about twice as wide as long, third segment elongate, slender, about as long as scape, at least three times as long as greatest width, fourth segment with an acute process, segments five to eleven distinctly lamellate, lamella of fifth segment two-thirds as long as that of sixth, lamella of sixth more than three-fourths as long as that of seventh segment, that of eighth a little shorter than ninth, lamella of ninth segment longest, those of tenth and eleventh segments decreasing in length, ratios of segments five to eleven 26:36:43:44:45:42:38. *Pronotum* approximately twice as wide as long, barely widest at posterior angles, posterior angles rounded, anterior concavity a little more coarsely punctate than disk, subglabrous, lateral discal impressions usually at middle, pubescence fine, sparse; legs clothed with long, golden hairs. *Elytra* together about one-fourth longer than broad, surface shining, finely, sparsely punctate, geminate striae very feeble. *Abdomen* reddish-brown, sternites coarsely but irregularly and not closely punctate. Length 27.5 mm.

Female: Form elongate oval, widest behind middle; color dark reddish-brown. *Head* with clypeus broadly expanded apically, angles prominent, median notch shallow; vertical horn very short, consisting of little more than a pair of lobes; antennae pale reddish, lamellae brownish, fourth segment angulate, fifth with a short lamella, sixth to eleventh forming club. *Pronotum* twice as

broad as long, widest at posterior angles, distinctly and closely punctate, punctures larger and denser anteriorly, disk with a vague, sparsely punctate, median longitudinal line; scutellum glabrous, sparsely punctate. *Elytra* widest behind middle, length to breadth as 28:23, surface deeply but irregularly punctate. Length 38 mm.

Holotype male (No. 5462, Calif. Acad. Sci., Ent.) and twenty-seven paratypes, also males, from Squaw Flat, SESPE CANYON, VENTURA COUNTY, CALIFORNIA, December 11, 1937 (R. E. Barrett). I have associated with these, but not designated as allotype, a female, supposedly from Sespe Canyon but with the locality open to question, also from the collection of Mr. Barrett, to whom the writer is very much indebted for the privilege of studying the species.

P. venturae is a member of the *conjungens* group. It differs from *conjungens* by its larger size (male 24-30 mm. as compared with 20-23.5 mm.; female 38 mm. as compared with 26-28 mm.), the fourth antennal segment angulate, not lamellate, and the ocular canthi of the male projecting at an angle. The female further differs from that of *conjungens* by having the clypeus broadly expanded and angulate with the margin shallowly notched, and the pronotum and elytra more deeply punctate. From *P. lucia*, it differs in having a distinct lamella on the fifth segment of the antennae which is at least half as long as that of the sixth segment, and the pronotum widest at the basal angles. It also differs from *lucia* in size (26-28 mm. as compared to 23 mm.). From the remaining members of the *conjungens* group, *blaisdelli*, *hirsuta*, *nitida*, and *badia* it may be immediately distinguished by the sparsely punctate, sparsely hairy, anterior pronotal impression.

PLEOCOMA AUSTRALIS FALL

Males of this species were captured during a heavy rain at Mountain Center, San Jacinto Mountains, California, October 24, 1941, by Mr. D. DeLeon. At 3 P.M. on the same day, additional specimens were captured during a drizzling rain 2 miles north of Kenworthy Ranger Station, also in the San Jacinto Mountains. On October 26, 1940, males were flying at Lake Hemet[1], the only other record from the San Jacinto Mountains.

[1] Linsley, E. G. 1941, Pan-Pacific Ent., 17:152.

Pleocoma badia Fall

Three males of *P. badia* were taken by Mr. R. E. Barrett on Strawberry Peak, Tujunga Canyon, Los Angeles County, California, December 1, 1922. In one example the pronotum is piceous, as is true also of one specimen in my series from Mt. Wilson, the only previously known locality for the species.

Pleocoma behrensi LeConte

To the recorded localities for this species may be added Half Moon Bay, San Mateo County, California, October 30, 1937 (L. Jensen). This provides the most extended record for the species in a southwesterly direction.

Pleocoma fimbriata LeConte

Previously known only from El Dorado County (Placerville and Snowline) and Placer County, California. Taken at Nevada City, Nevada County, California, October 26, 1940, by W. F. Barr.

Pleocoma rickseckeri Horn

This species has heretofore been known only from the type locality: Sylvania, Sonoma County, California. It also occurs at Santa Rosa, Sonoma County and in Napa County at Angwin, California, where males were captured flying in the rain, on November 9, 1940, by Mr. M. I. Sherman.

Pleocoma tularensis Leach

Specimens in the collection of Mr. B. E. White are from 10 miles south of Mariposa, Mariposa County, California, providing the northernmost record for this species. Males were also taken at Northfork, Madera County, California, December 14, 1936, by T. W. Daniel.

Pleocoma hirticollis vandykei Linsley

A series of more than one hundred males and sixteen females of this subspecies, captured at Patterson Pass, Alameda County, California, by R. F. Smith, R. W. L. Potts, A. E. Michelbacher, and the writer, has afforded an opportunity to investigate varia-

tion in size, as determined by measurements of length from apex of clypeal horn to apex of elytra. The results follow:

MALES		FEMALES	
Length in millimeters	Number of specimens	Length in millimeters	Number of specimens
20.0	2	24.5	1
20.5	4	25.0	2
21.0	4	25.5	1
21.5	17	26.0	2
22.0	22	26.5	3
22.5	24	27.0	2
23.0	20	27.5	2
23.5	11	28.0	1
24.0	9	28.5	1
24.5	2	29.0	1
	115		16

Although the size ranges indicated above are outside of those ascribed to *P. hirticollis hirticollis* Schaufuss (males: 25-28 mm.; females: 33 mm.), this is probably the result of a different method of measurement. Of more significance, perhaps, is the relatively narrow size range evident in the sample. It remains to be seen whether or not other species exhibit a similar uniformity.

A male of *vandykei* was captured at Lafayette, Contra Costa County, California, on November 5, 1944, by R. F. Smith.

PLEOCOMA DUBITALIS DAVIS

Males and females of *P. dubitalis dubitalis* Davis were captured by K. M. and D. M. Fender, along Baker Creek, about 8 miles westnorthwest of McMinnville, Yamhill County, Oregon, on October 23, 1938. Elytra and other fragments have also been found by Mr. and Mrs. Fender along Panther Creek, 2 miles north of McMinnville. In the Baker Creek area, males were captured flying near dusk through sparse woods of Douglas fir, *Pseudotsuga taxifolia*, during the fall rainy season. Males were also taken along rather hard packed paths, as many as four or five together, attempting to dig down to females.

PLEOCOMA SP.

Imperfect specimens of an undetermined species of *Pleocoma* were taken in a forested area near Lyonsville, about 30 miles

east of Red Bluff, Tehama County, California, in the fall of 1935 by A. N. Smoot. They represent the first record for the genus in Tehama County and appear to belong to the *shastensis-carinata-simi* group.

Pleocoma sp.

Mr. H. H. Keifer has called my attention to larvae of *Pleocoma* from Leona Valley, Palmdale, Los Angeles County, California, where they were injuring apple roots. It is not possible at present to state just what species these represent, but in view of the nearness of the locality to the Sierra Madre Mountains it is possible that they may prove to be *P. badia* Fall, or, a little less likely, *P. hirsuta* Davis.

Pleocoma sp.

In the University of California collection there is a female *Pleocoma* from Mt. Diablo, Contra Costa County, California, collected by Mr. L. M. McQuesten. No species has been recorded previously from this mountain and in view of its isolation it is highy probable that it represents an undescribed species. The specimen clearly belongs to the *behrensi* group and appears to be related to *sonomae* Linsley as indicated by the 4-lamellate antennal club with the seventh antennal segment transverse, angulate but not lamellate. The vertical horn is very shallowly notched at the apex, the clypeus rounded.

FRANK E. BLAISDELL, SR.

Dr. Frank E. Blaisdell, Sr., has retired from active research work on the Coleoptera at the California Academy of Sciences, San Francisco. His present address is 22 High Street, Watsonville, Santa Cruz County, California.

BIOLOGICAL NOTES ON PLEOCOMA HIRTICOLLIS VANDYKEI LINSLEY

(Coleoptera; Scarabaeidae)

BY R. F. SMITH AND R. W. L. POTTS
University of California, Berkeley

The discovery of this species in considerable numbers results in the establishment of a habitat new to the Pleocominae. Heretofore the known and recorded habitats were primarily in a forest association, secondarily in chaparal, now, for the first time, a habitat is known in the open, hilly grassland. The following fragmentary notes are therefore of interest.

COLLECTION DATA: January 21, 1944, near Patterson Pass, eastern Alameda County, California, three elytra of a *Pleocoma* were found at two ground squirrel middens by the authors. October 30, 37 ♂♂ were collected by E. G. Linsley and Ray F. Smith. November 4, 78 ♂♂ and 17♀♀ were collected by E. G. Linsley, A. E. Michelbacher, and the authors. November 14, A. E. Michelbacher and Ray F. Smith were unable to find specimens at the locality after a week of dry weather.

LOCALITY DATA: Approximately one-half mile east of summit of Patterson Pass, extending about one-fourth mile south and one-half mile north of road, altitude between 1,150 and 1,350 feet, in the rolling, grassy hills extending from Mount Diablo southward, forming the western boundary of the San Joaquin Valley.

The general aspect is of grass pasture land in an area of numerous hillocks, gentle slopes and small gullies. The entire area slopes in a more or less northeasterly direction, following a small intermittent tributary of Mountain House Creek. The drainage, in general, is good but one or two small ponds form in winter where there is no outlet to the stream.

The soil, as described by Cole, et. al.[1], belongs to the Linne series and the greater part of the area is a dark brownish hard adobe with some rock outcrop of the clay loam phase. Most of the females were taken near this latter, although they were not limited to this part of the area, being found south of the road as well.

[1] Cole, R. C., et. al., 1943. Soil Survey of the Tracy Area, California. U.S.D.A. Soil Survey Series 1938 (5) :95 pp. illus., 1 map.

In the spring the entire area is covered by such plants as *Erodium, Echinocystis fabacea, Lupinus, Trifolium, Viola pedunculata, Broadiaea capitata, Ranunculus californicus,* and a number of grasses. As is common in this hilly area most of the pasture land is covered with introduced plants. It is not known whether this station has ever been cultivated, but the area has been pastured for at least three years. The rather deep gully alongside the station contained the characteristic stream border plants of this area, such as *Salix, Sambucus, Rosa,* etc.; however, the beetles were definitely not associated with any of these.

Ground squirrel burrows are common at the northern portion of the site and scattered everywhere. *Stenopelmatus* and spider holes are also exceedingly numerous.

Specimens were taken over a wide area, although they were more concentrated near the outcrop before mentioned and at and near a small gully to the south of the road.

WEATHER DATA: As previously recorded[2], emergence of certain *Pleocoma* depends on a soaking rain of about one-half inch or more. This proved true for *vandykei as* well. Records for the season of 1944 are as follows for nearby points:

DATE	LOCALITIES			
	Livermore	Young Ranch	Lathrop	2 mi. NE Livermore
October 20-21.	.09	.10	.04	.11
October 30-31.	.68	.85	1.01	.93
November 3-5.	1.09	.74	.72	.93
November 7.....	.27	.25	.23	.31

The Lathrop station is approximately 20 miles to the east in the San Joaquin Valley. The Livermore station is 9 miles to the west, on the other side of the hills. The Young Ranch is nearest to the locality and in a somewhat similar area 2.25 miles to the northwest.

In the Patterson Pass area there probably was a light rain of about a tenth of an inch on October 20 and 21. The second rain of the season, October 30 and 31, would have been about three-fourths of an inch, or more. The third rain, November 3 to 5, was about equal in precipitation.

MALE FLIGHT BEHAVIOR: Males were observed flying from 12:00 noon until 6:15 P.M., under conditions that varied from a

[2] Linsley, E. G. 1935. New Species of *Pleocoma* with notes concerning others. Pan-Pac. Ent., 11(1):14.

heavy rain to late afternoon sunshine to after dark, and from a slight breeze to a strong northwest wind. They appeared to be most abundant about the middle of the afternoon. On the whole, the weather was rather cold and threatening.

The normal flight pattern was a slow sweeping flight back and forth over the ground apparently in search for female burrows. These searching flights were made for about 50 to 200 yards mainly into the wind. Then a long, straight, return flight was made down wind and the searching flight would begin again. While going upwind the progress of the male *Pleocoma* was slow and one could keep up with them by walking slowly, but on the downwind flight one had to run hard to keep the beetle in sight. The entire flights were frequently of long duration. In one instance a male was followed on his route for over a mile. While searching, the males usually flew about twelve to eighteen inches or even less above the surface of the ground, but on the downwind flight they flew as high as ten to fifteen feet. When knocked to the ground by flying into plants they would crawl a few inches and then take wing again. Along toward dusk an occasional male would begin to dig into the soil. This was not in search of females, but in preparation for resting or spending the night. Apparently the males pass the night a few inches beneath the surface.

The males were not attracted to a Coleman lantern.

FEMALE BEHAVIOR: No females were found on October 30. On November 4, seventeen females were removed from their burrows. Most of the females were in the dry soil, i.e., below the penetration of the rain, at depths varying from about three to ten inches. Most of the holes were open, but in several instances the holes had been plugged. After copulation, the female apparently retreats to lower depths in the soil. There did not seem to be any special area where the females were concentrated. In several cases, one to four males were either in or near the female burrow. The diameter of a female burrow was measured as seven-eighths inches. In five instances cast pupal or larval skins were found at the bottom of the female hole.

LARVAE: While digging for the adults, four larvae were unearthed. These were of three sizes: the smallest, about three-eighths of an inch in length, the largest of a size approximately equal to that of the beetle, and two about midway between. This

would seem to indicate a life-cycle of more than one year for this species.

SUMMARY: It seems evident from our observations in this locality that *Pleocoma hirticollis vandykei* Linsley is a pasture land form. A rain of about one-half inch is apparently necessary to release the males in the fall. The males emerge before the females and search out their burrows. They enter the female tunnel to copulate. After copulation the female plugs her burrow and passes downward. The males spend the nights in small burrows which they dig each night. The life cycle is apparently of at least two or three years duration, the larvae feeding on one or another, or perhaps generally on the roots of the pasture-grassland plants.

ABUNDANCE OF *HYPERA PUNCTATA* (FABR.) IN 1945

Under usual conditions of weather and enemies, the clover-leaf weevil, *Hypera punctata* (Fabr.) never reaches a population level in California where it can do economic damage. The distribution and damage by this weevil have been discussed in a previous note (1944, Pan-Pac. Ent. 20 (3):120). At that time it was suggested that a fungous disease of the larvae which is very common in the winter and spring is associated with the low population levels. In all probability this disease is dependent on weather conditions for its effectiveness.

In the spring of 1945, the clover leaf weevil bred up in very large numbers on bur clover, *Medicago hispida*, at various stations in Contra Costa and Alameda counties. Larvae were very abundant in April and there was little fungous disease. The absence of the disease may be associated with the unusually dry and warm April. These larvae reached maturity near the end of April and early in May and adults were very abundant after the first week of May. The adults remained abundant in the grasslands for about three weeks or until the plants were completely dried up. At this time numerous complaints were received from home gardeners and others situated near the open uncultivated area. The adult weevils moved into the yards and houses in very large numbers and caused considerable annoyance. The adults were also observed collecting at watering troughs.

In 1944, a similar outbreak occurred in Scott Valley, Siskiyou County. In this case the clover leaf weevil caused considerable defoliation to alfalfa.— RAY F. SMITH AND A. E. MICHELBACHER.

HYALOPTEROIDES PALLIDA THEOBALD, AN APHID NEW TO NORTH AMERICA

(Hemiptera, Aphididae)

BY E. O. ESSIG
University of California, Berkeley

This very interesting and little-known aphid was recently collected on orchard grass, *Dactylis glomerata* L., growing in a greenhouse on the campus of the Oregon State College, Corvallis, Oregon, on February 24, 1945, by D. C. Mote and H. E. Morrison. The latter succeeded in taking a good series of all stages of apterous and several alate females. The alates were the first of this stage so far procured. The specimens were forwarded in alcohol to me for determination. In response to my request another collection was made by Mote and Morrison on April 12, so that altogether some 50 adults were prepared and mounted on microscopic slides, some of which were returned to the collectors. The aphid is a pale yellowish-green species somewhat pulverulent and of a grayish or whitish cast. It occurs in seclusion between the culmns and leaves or in the heads and may also possibly occur at the bases of the plants and even about the roots.

The history of this aphid is short and interesting. It was described as a new genus and new species by F. V. Theobald (Entom. 49:51-2, 1916) from a single adult apterous female taken in a nest of the black ant, *Acanthomyops niger* (L.), at Porlock Weir, Somerset, England, May 14, 1915. Its most marked characters are the presence of 4 or 5 sensoria on antennal segment III of the apterae; the large, almost spineless cauda; the small, corrugated cornicles; and the row of 18-20 circular sensoria on antennal segment III of the alatae which extend over the full length of the segment excepting the basal area. Later Theobald (Plant Lice or Aphididae of Great Britain, 1:224-5,1926) reported other apterous specimens taken on a potato leaf at Swordale, Evanton, Rossshire, Scotland.

While collecting aphids in England, I was fortunate enough to take a large series of additional apterous forms of this aphid by sweeping grasses along the roadside, at Reigate, Surrey, England, on May 20, 1937, shortly before leaving that country. Specimens of these, in my collection, have served for the identification of the Oregon specimens.

Since this insect has never before been observed in North America it may possibly have been introduced. However, there is as yet no possible clue as to how this may have occurred. So far as known the aphid is of no great economic importance.

CEPHENEMYIA JELLISONI TOWNSEND (DIPTERA CUTEREBRIDAE) REARED FROM NASAL BOT OF BLACKTAILED DEER

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Very few *Cephenemyia* spp. have been reared in captivity. Numerous attempts by the author, prior to the one reported here, were unsuccessful.

On January 22, 1945, Warden C. L. Gourley examined a deer (*Odocoileus hemionus columbianus*) found dead near Big Bar, Trinity County, California, at an elevation of approximately 1,250 feet. Three maggots were removed from the nasal chambers, wrapped in waxed paper and shipped to the author for study. On examination after arrival in San Francisco on January 25, the specimens were found to be two fully pigmented third stage larvae and a pupa of *Cephenemyia* sp. All three specimens were placed in a closed pint jar and kept at room temperature. The two larvae pupated within a few days but collapsed in the process. A fly emerged from the pupal case on February 15, 1945, after a period of 21 to 24 days.

The fly was identified as *Cephenemyia jellisoni* Townsend. Identification was verified by Dr. M. T. James of the U. S. National Museum. The specimen has been deposited in the collection of the Division of Entomology and Parasitology of the University of California at Berkeley.

The only other published record of the successful rearing of this fly in captivity was reported by Jellison (1935, Proc. Helminth. Soc., Washington 2:69) from maggots collected from deer (*Odocoileus hemionus*) in Montana on April 28. The several flies he was able to rear all required a pupal period of more than 50 days. Jellison originally reported his specimens as *C. pratti*, but they were later described as *C. jellisoni* by Townsend (1941, Jour. N. Y. Ent. Soc., 49:161-163).